

# ABSTRACT

To improve a power balance of an optical add multiplexer, an add amplifier is optically coupled to an add path of an optical add module. A through loss associated with a signal passing through the add module, and an add loss associated with a signal travelling an add path of the add module are known or otherwise calibrated values. An input power measurement of the signal input to the add module is used in conjunction with the through loss, add loss, and number of added channels to determine an add path amplification value. The gain of the add amplifier is controlled according to add path amplification value so that the power level of added channel(s) substantially matches the power level of the WDM signal output from the add multiplexer. Furthermore, the gain profile of the add amplifier preferably matches a gain profile of a signal input to the add module. In this way, the power level and gain profile of the added channel(s) can be controlled to match the power level and gain profile of the signal passing through the add module. These same techniques may also be applied to an optical add/drop multiplexer that not dropping any channels but is adding at least one channel.